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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/705,433	11/12/2003	Kanya Ishizaka	117730	4586

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EXAMINER	
TORRES, JOSE	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/705,433	ISHIZAKA, KANYA	
	Examiner	Art Unit	
	José M. Torres	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 November 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-33 and 35* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,8-11,16-19,24-27,32,33 and 35* is/are rejected.

7)☒ Claim(s) *4-7, 12-15, 20-23 and 28-31* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on November 14, 2007 has been entered and made of record.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 3, 8-11, 18, 19, 24-27 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moon et al. (U.S. Pat. No. 5,701,369) in view of Jacobs et al. (U.S. Pat. No. 5,416,856).

As to claims 1 and 18, Moon et al. teaches an image processing apparatus/method for performing an image quality improving processing of an image, comprising: a domain block extracting section (FIG. 3, "Control Unit **20** and Range Block Memory **40**") for extracting a domain block image (FIG. 1, "Range Block Ri") from

an original image (FIG. 1, "Composite Image **100**") in the unit of a first block unit (Col. 3 lines 34-56); a range block extracting section (FIG. 3, "Control Unit **20** and Domain Block Memory **30**") for extracting a range block image (FIG. 1, "Domain Block D_J") from the original image in the unit of a second block unit which is larger than the first block unit with respect to the domain block image (Col. 3 lines 34-56); a reduced range block forming section (FIG. 3, "Control Unit **20**") for reducing the extracted range block image to the size of the first block unit (Col. 5 line 54 through Col. 6 line 29 and Col. 7 lines 31-36); and a similarity judging section (FIG. 3, "Control Unit **20**") for judging a similarity degree ("Maximum Degree of Similarity") between the domain block image and the reduced range block image by the reduced range block forming section (Col. 6 lines 55-61).

However, Moon et al. does not explicitly disclose an improved domain block forming section for performing a pixel value conversion with respect to the reduced range block image formed by the reduced range block forming section, and for outputting the pixel-value-converted reduced range block image as an improved domain block; the improved domain block forming section performs the pixel value conversion based upon the similarity degree obtained by the similarity degree judging section.

Within the same field of art (Fractal image coding), Jacobs et al. teaches an improved domain block forming section (FIG. 7, "Optimizer and Transformer **30**") for performing a pixel value conversion ("transformation") with respect to the reduced range block image formed by the reduced range block forming section (FIG. 7, "Partitioner **26** and Partitioner **28**"), and for outputting the pixel-value-converted reduced range block

image as an improved domain block (Col. 9 line 61 through Col. 10 line 16); the improved domain block forming section performs the pixel value conversion based upon the similarity degree ("best") obtained by the similarity degree judging section (FIG. 7, "Processor **32** and Comparator **34**" As stated in at least Col. 4 lines 13-51, line 59 through Col. 5 line 50, Col. 7 lines 19-48 and Col. 9 line 61 through Col. 10 line 16, the Processor **32** and Comparator **34** performs error calculation and the output of the domain which best minimizes the error, therefore, outputting a domain which is based on a "best" match scheme. The pixel value transformation (using the optimized transformation w_j) for the domain corresponds to an improved domain block.).

Therefore, in view of Jacobs et al., it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Moon et al. by incorporating the processor and the comparator to perform a pixel value conversion with respect to the reduced range block image based upon a similarity degree in order to compactly store an image at a desired level of fidelity (Col. 3 lines 33-55 and Col. 4 lines 1-13).

As to claims 3 and 19, Moon et al. does not explicitly disclose a domain block classifying section for classifying a sort of the domain block image extracted by the domain block extracting section, wherein the domain block image other than the domain block image which has been classified to a previously determined sort is directly outputted as the improved domain block image.

Jacobs et al. further teaches a domain block classifying section ("Classification Scheme") for classifying a sort of the domain block image extracted by the domain block

extracting section, wherein the domain block image other than the domain block image which has been classified to a previously determined sort is directly outputted as the improved domain block image (Col. 7 lines 19-48).

As to claims 8 and 24, Moon et al. further teaches the range block extracting section extracts the range block image which contains the domain block image extracted by the domain block extracting section as the range block image (FIG. 4A, Col. 5 lines 28-41).

As to claims 9 and 25, Moon et al. further teaches the range block extracting section extracts a plurality of the range block images with respect to one of the domain block images (FIG. 4, Col. 5 lines 28-36); the reduced range block forming section executes a reducing processing as to the plurality of range block images (Col. 5 lines 54-61); and the similarity degree judging section selects a reduced range block image which is judged as the image having the highest similarity degree with respect to the domain block image among a plurality of the reduced range block images (Col. 6 lines 40-61).

As to claims 10 and 26, Moon et al. further teaches wherein when a pixel value "z" of the reduced range block image is least-squares-approximated ("least square method") to the pixel value of the domain block image by a linear transformation "az + b" (Equation (1)), the similarity degree judging section judges the reduced range block

image having the smallest least squares error ("Optimal m and n") as a most resemblant reduced range block image having the highest similarity degree (FIG. 3, "Slope and Offset Detector **50**", Col. 5 line 61 through col. 6 line 39).

As to claims 11 and 27, Moon et al. further teaches wherein the improved domain block forming section forms the improved domain block image in such a way that the pixel value of the most resemblant reduced range block image is converted by the linear transformation "az + b" (Equation (1)) with employment of least squares coefficients "a" ("m") and "b" ("n"), which correspond to the most resemblant reduced range block image obtained by the similarity degree judging section (FIG. 3, "Slope and Offset Detector **50**", Col. 5 line 61 through col. 6 line 39).

As to claim 35, Moon et al. disclose extracting a domain block image (FIG. 1 "Range Block Ri") from an original image (FIG. 1, "composite image **100**") in a size of a first block unit (Col. 3 lines 34-56); extracting a range block image (FIG. 1, "Domain Block D_J") from the original image in the unit of a second block unit larger than the first block unit with respect to the domain block image (Col. 3 lines 34-56); reducing a size of the extracted range block image to the size of the first block unit (Col. 5 lines 54-61); and judging a similarity degree between the reduced range block image and the domain block image (Col. 6 lines 40-54).

However, Moon et al. does not explicitly disclose a computer-readable storage medium storing a program for causing a computer to execute an image processing, and

forming an improved domain block image based upon a result obtained by converting pixel values as to the reduced range block image based upon the similarity degree.

Moon et al. further teach an image compression device comprising storage means, calculating means and control means (Claim 12), which corresponds to a memory and a processor. Since these type of computer devices are controlled by computer-implemented instructions, it would be apparent to one of ordinary skill in the art to implement the image processing device as taught by Moon et al. as a computer program stored on a computer readable storage.

Jacobs et al. teaches forming an improved domain block image based upon a result obtained by converting pixel values as to the reduced range block image based upon the similarity degree (FIG. 7, "Processor **32** and Comparator **34**" As stated in at least Col. 4 lines 13-51, line 59 through Col. 5 line 50, Col. 7 lines 19-48 and Col. 9 line 61 through Col. 10 line 16, the Processor **32** and Comparator **34** performs error calculation and the output of the domain which best minimizes the error, therefore, outputting a domain which is based on a "best" match scheme. The pixel value transformation (using the optimized transformation w_j) for the domain corresponds to an improved domain block.).

Therefore, in view of Moon et al. and Jacobs et al., it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the image processing system as a computer program stored on a computer readable storage in order to accomplish a real time image processing system by reducing the number of the domain blocks to be evaluated (Moon et al. Col. 7 lines 31-36),

incorporating the processor's and the comparator's instructions to perform a pixel value conversion with respect to the reduced range block image based upon a similarity degree in order to compactly store an image at a desired level of fidelity (Jacobs et al. Col. 3 lines 33-55 and Col. 4 lines 1-13).

4. Claims 16, 17, 32 and 33 rejected under 35 U.S.C. 103(a) as being unpatentable over Moon et al. in view of Jacobs et al. as applied to claims 1 and 18 above, and further in view of Bonneau et al. (U.S. Pat. No. 6,002,794). The teachings of Moon et al. and Jacobs et al. Have been discussed above.

As to claims 16 and 32, Moon et al. further teaches the domain block extracting section extracts the domain block image in such a manner that the domain block image owns a cover portion on the original image (FIG. 1, Col. 3 lines 35-56).

However, Moon et al. and Jacobs et al. fails to teach an averaged value calculating section for calculating an average value with respect to pixels where a plurality of the improved domain block images are overlapped with each other.

Bonneau et al. teaches an averaged value calculating section for calculating an average value with respect to pixels where a plurality of the improved domain block images are overlapped with each other (FIG. 1, "Step **107**", Col. 8 lines 36-63, FIG. 4, "Domain Blocks **401**", Col. 13 lines 30-52 and FIG. 18, "Video Encoding Portion **1801**", Col. 25 lines 22-36).

Therefore, in view of Bonneau et al., it would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify Moon et al.

and Jacobs et al. by incorporating the video encoding portion to calculate an average value and where the improved domain blocks images are overlapped with each other in order to increase the compression ratio and allow faster processing (Col. 18 lines 33-35).

As to claims 17 and 33, Moon et al. and Jacobs et al. fails to teach the original image corresponds to a color image, and the range block extracting section extracts the range block images from relatively same positions as to the respective color components of the original image.

Bonneau et al. teaches the original image corresponds to a color image (FIG. 19, Col. 26 lines 9-19), and the range block extracting section (FIG. 18, "video encoding portion **1801**") extracts the range block images from relatively same positions as to the respective color components of the original image (FIG. 1, "step **105**" Col. 8 lines 1-3, Col. 25 lines 22-36 and Col. 26 lines 20-48).

Therefore, in view of Bonneau et al., it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Moon et al. and Jacobs et al. by incorporating the original image as a color image and the video encoding portion to extract the range block images from relatively same positions as the respective color components of the color image in order to achieve high compression, have selective and accurate feature preservation and is computationally efficient (Col.. 5 lines 64-67).

Allowable Subject Matter

5. Claims 4-7, 12-15, 20-23 and 28-31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

The closest prior art of record failed to teach or suggest the domain block classifying section classifies the domain block image to a flat portion, a step edge portion, a noise portion, and a texture portion based upon both a standard deviation and a concave/convex degree of the domain block and an edge emphasizing section for executing an edge enhancement processing with respect to the improved domain block image based upon both a relationship between a maximum value and a minimum value of the pixel values within the improved domain block images, and an edge degree of the improved domain block image.

Response to Arguments

Claim Rejections under 35 U.S.C. § 102 and 103

6. Applicant's arguments with respect to claims 1, 18 and 35 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Barnsley et al. '447 disclose a Method and Apparatus for

Processing Digital Data and Barnsley et al. '600 disclose a Method and Apparatus for Compression and Decompression of Digital Image Data.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to José M. Torres whose telephone number is 571-270-1356. The examiner can normally be reached on Monday thru Friday: 8:00am - 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jingge Wu can be reached on 571-272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JMT
01/09/2008

JINGGE WU
SUPERVISORY PATENT EXAMINER